

CLAIMS

1. A silicon wafer, characterized in that an attached boron amount on a surface of the silicon wafer is 1×10^{10} atoms/cm² or less.

5 2. A silicon wafer, characterized in that an increment of a boron concentration in a surface layer down to a depth of 0.5 μ m relative to a boron concentration in bulk silicon direct beneath the surface layer is 1×10^{15} atoms/cm³ or less.

3. A silicon wafer, characterized in that the silicon wafer has a polycrystal silicon layer on one of major surfaces thereof and an increment of a boron concentration in an adjacent layer of a thickness of 1 μ m adjacent to and including an interface between the polycrystal silicon layer and a single crystal silicon layer relative to a boron concentration in silicon in external contact with the adjacent layer is 1×10^{15} atoms/cm³ or less.

4. A silicon epitaxial wafer, characterized in that the silicon epitaxial wafer has a structure in which a polycrystal silicon layer is provided on a back surface of a single crystal silicon substrate and an increment of a boron concentration in an adjacent layer of a thickness of 1 μ m adjacent to and including an interface between single crystal silicon of the substrate and the polycrystal silicon layer relative to a boron concentration in silicon of the substrate in external contact with the adjacent layer is 1×10^{15} atoms/cm³ or less.

5. A silicon wafer, characterized in that the silicon wafer has a structure in which a CVD silicon oxide film is provided on one of

major surfaces thereof and an increment of a boron concentration in a single crystal silicon adjacent layer of a thickness within 0.5 μm of an interface between the CVD silicon oxide film and the silicon wafer relative to a boron concentration in bulk silicon in contact with the adjacent layer is 1×10^{15} atoms/cm³ or less.

6. A silicon epitaxial wafer, characterized in that the silicon epitaxial wafer has a structure in which a CVD silicon oxide film is provided on a back surface of a single crystal silicon substrate and an increment of a boron concentration in a substrate single crystal silicon adjacent layer of a thickness within 0.5 μm of an interface between the CVD silicon oxide film and the substrate relative to a boron concentration in silicon of the substrate in contact with the adjacent layer is 1×10^{15} atoms/cm³ or less.

7. A silicon wafer according to claim 3, characterized in that the polycrystal layer a boron concentration in at least part of which is 5×10^{14} atoms/cm³ or less is provided on a back surface of the silicon wafer.

8. A silicon epitaxial wafer according to claim 4, characterized in that the polycrystal layer a boron concentration in at least part of which is 5×10^{14} atoms/cm³ or less is provided on a back surface of the single crystal silicon substrate.

9. A silicon wafer, characterized in that the silicon wafer has a structure in which a polycrystal silicon layer is provided on one major surface of a single crystal silicon layer and a CVD silicon oxide film is further provided on the polycrystal silicon layer, and an increment of

a boron concentration in a first adjacent layer of a thickness of 1 μm adjacent to and including an interface between the polycrystal silicon layer and the single crystal silicon layer relative to a boron concentration in silicon in external contact with the first adjacent layer is 1×10^{15} atoms/cm³ or less and an increment of a boron concentration in a polycrystal silicon adjacent layer of a thickness of 0.5 μm adjacent to and including an interface between the CVD silicon oxide film and the polycrystal silicon layer relative to a boron concentration in polycrystal silicon in external contact with the polycrystal silicon adjacent layer is 1×10^{15} atoms/cm³ or less.

10. A silicon epitaxial wafer, characterized in that the silicon epitaxial wafer has a structure in which a polycrystal silicon layer is provided on a back surface of a substrate and a CVD silicon oxide film is further provided on the polycrystal silicon layer, and an increment of a boron concentration in a second adjacent layer of a thickness of 1 μm adjacent to and including an interface between the polycrystal silicon layer and a single crystal silicon layer relative to a boron concentration in silicon in external contact with the second adjacent layer is 1×10^{15} atoms/cm³ or less and an increment of a boron concentration in a polycrystal silicon adjacent layer of a thickness of 0.5 μm adjacent to and including an interface between the CVD silicon oxide film and the polycrystal silicon layer relative to a boron concentration in polycrystal silicon in external contact with the polycrystal silicon adjacent layer is 1×10^{15} atoms/cm³ or less.

11. A silicon wafer according to any of claims 1 to 3, 5, 7 and 9,

characterized in that a boron concentration in the single crystal silicon bulk is 1×10^{16} atoms/cm³ or less.

12. A silicon epitaxial wafer according to any of claims 4, 6, 8 and 10, characterized in that a boron concentration in the substrate is 1×10^{16} atoms/cm³ or less.

13. A manufacturing process for a silicon wafer, characterized in that in manufacture of the silicon wafer according to any of claims 1 to 3, 5, 9 and 11, the silicon wafer is subjected to handling such as treatment and storage in an atmosphere of a boron concentration of 15 ng/m³ or less.

14. A manufacturing process for a silicon epitaxial wafer, characterized in that in manufacture of the silicon epitaxial wafer according to any of claims 4, 6, 8, 10 and 12, the silicon epitaxial wafer is subjected to handling such as treatment and storage in an atmosphere of a boron concentration of 15 ng/m³ or less.

15. A manufacturing process for a silicon wafer, characterized in that in manufacture of the silicon wafer according to any of claims 3, 7 and 9, formation of a polycrystal silicon layer is performed in an atmosphere of a boron concentration of 15 ng/m³ or less.

16. A manufacturing process for a silicon epitaxial wafer, characterized in that in manufacture of the silicon epitaxial wafer according to any of claims 4, 8, 10 and 12, formation of a polycrystal silicon layer is performed in an atmosphere of a boron concentration of 15 ng/m³ or less.

17. A manufacturing process for a silicon wafer, characterized in

that in manufacture of the silicon wafer according to any of claims 5, 9 and 11, formation of a CVD silicon oxide film is performed in an atmosphere of a boron concentration of 15 ng/m^3 or less.

18. A manufacturing process for a silicon epitaxial wafer, characterized in that in manufacture of the silicon epitaxial wafer according to any of claims 6, 10 and 12, formation of a CVD silicon oxide film is performed in an atmosphere of a boron concentration of 15 ng/m^3 or less.

19. A manufacturing process for a silicon wafer, characterized in that in manufacture of the silicon wafer according to any of claims 3, 7, 9 and 11, a polycrystal layer is formed on a surface on which an attached boron amount is suppressed to $1 \times 10^{10} \text{ atoms/cm}^2$ or less.

20. A manufacturing process for a silicon epitaxial wafer, characterized in that the manufacture of the silicon epitaxial wafer according to any of claims 4, 8, 10 and 12, a polycrystal layer is formed on a surface on which an attached boron amount is suppressed to $1 \times 10^{10} \text{ atoms/cm}^2$ or less.

21. An atmosphere control apparatus, characterized in that the atmosphere control apparatus controls a boron concentration in an atmosphere to be 15 ng/m^3 or less.

22. A clean room, characterized in that a boron concentration in an atmosphere of the clean room is 15 ng/m^3 or less.

23. Clean room air conditioning facilities comprising: an air conditioner having a boron-less filter and a boron adsorbing filter; and one or more of wafer treatment apparatuses each having a

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1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	